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ORIGINAL RESEARCH

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Early maladaptive schemas and asthma: disconnection and rejection domains may have an effect on the severity of asthma

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Abstract

Introduction: Early maladaptive schemas (EMSs) that are being shaped through the early period of development of humans have been reported to affect the functions of asthmatic patients. This study focuses on the probable relationship between the personality schemas and areas with severity of asthma.

Material and methods: Fifty asthmatic patients were entered this descriptive cross-sectional study in Tabriz University of Medical Sciences from March to August, 2016. We measured the personality schema of patients by using the Young Schema Questionnaire — Short Form (YSQ-SF; Young, 1994). On the other hand, patients' clinical findings and severity of asthma were assessed by spirometry and the Asthma Control Test (ACT) questionnaire.

Results: Uncontrolled (ACT score < 20) and controlled (ACT score ≥ 20) asthma had significant defect in 'Disconnection domain' ($p = 0.001$). Also, significant reverse linear correlation was found between FEV_1 and 'Disconnection domain', 'Rejection' schema area ($r = -0.29$, $p = 0.03$), and 'Over vigilance domain' ($r = -0,36$, $p = 0.01$). Whereas, significant reverse linear correlation was revealed between FEV_1/FVC and Over vigilance domain ($r = -0.41$, $p = 0.003$).

Conclusion: EMSs possibly have potential effects on clinical characteristics and severity of asthma in asthmatic patients.

Key words: asthma, personality schemas, asthma severity

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Introduction

Asthma is a condition identified with airway inflammation and reversible airway obstruction. The frequency of asthma is increasing and the average prevalence in Iran is 14% [1, 2]. There are evidences that psychological issues are closely associated with the disease. In addition, it is widely accepted that stress inducing events, depression and neuroticism may play a role in asthma subjects [3, 4].

Asthma patients are more susceptible to stress -related disorders, which might lead to the deterioration of asthma symptoms [3, 5, 6]. Experiencing stress for a long time by asthma patients has been attributed to the chronicity and severity of the disease [7].

A recent study has showed the association between chronic stress and asthma, suggesting a genetic basis for vulnerability to psychosomatic disorders [8].

Early maladaptive schemas (EMSs) form in the early human life. They are cognitive styles that affect human behaviors in relation to one's environment and continues throughout one's life [3]. Schemas emphasize basic cognitive problems developed during childhood via the relationship with parents, and this fact can form

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the basis of familial factors contribution to the development of asthma.

According to our knowledge, previous studies only evaluated personality schemas in asthma patients but there are no researches that assess the effect of personality schemas on clinical and objective asthma severity. In this study, the personality schemas of asthma patients were evaluated in controlled and uncontrolled asthma subjects, using the Asthma Control Test (ACT) questionnaire (provided by the Global Initiative for Asthma (GINA)), moreover, the correlation between them and objective measurements of spirometry (as indicative of severity of the disease) were assessed.

Material and methods

We enrolled for the study seventy outpatient cases of asthma who were diagnosed according to the American Thoracic Society and the European Respiratory Society (ATS/ERS) criteria [9].

In accordance with the results of a ten-person study, the intensity correlation between two variables, FEV_1 and EMSs, was calculated as: $r = 0.44$. Considering $= 0.05$, power of 80%, and the difference of 0.07, the required samples for the study were calculated to be 46. To increase the validity of the analysis and taking into account the dropouts, 50 samples were set to be the sample size of the study. These patients were the cases of outpatient asthma, who were being visited in the outpatient pulmonary diseases clinic, in Tabriz University of Medical Sciences, Iran, from March to August 2016.

The patients were excluded if they had a history of psychological disease, antipsychotic therapy and recent upper respiratory tract infection (in the last month), allergic rhinitis, gastro-esophageal reflux, smoking history, history of respiratory disease (other than asthma), heart failure and any other systemic disease such as thyroid and renal disorders, diabetes mellitus, chronic inflammatory diseases, or if they did not cooperate.

The clinical characteristics and severity of asthma assessed by spirometry, and the impairment of personality schemas in each patient were evaluated.

The Young Schema Questionnaire — Short Form (YSQ-SF; Young, 1994) was used to analyse 15 items of early maladaptive schemas (EMSs), along with an interview with a psychologist. The clinical severity of asthma using the ACT questionnaire (GINA) was divided into two groups: controlled one (ACT score ≥ 20) and uncontrolled one (ACT score < 20).

In all asthma patients, spirometry was performed to assess the objective severity of asthma (provided by Jaeger; Germany). The equipment was calibrated every morning by a respiratory laboratory technician before performing any pulmonary function tests.

The participants were informed about the aim of the study and were explained regarding all the items of the YSQ-SF questionnaire. The pulmonary lab technician was blinded to the results of the questionnaires.

The study variables encompassed FEV_1, FVC, FEV_1/FVC according to the ATS criteria, asthma clinical severity in accordance with the patients' ACT score (GINA), and 15 items under five domains of the EMSs in line with YSQ-SF; Young (1994) that included *Disconnection and Rejection* (emotional deprivation, abandonment/instability, mistrust/abuse, social isolation/alienation, defectiveness/shame), *Impaired autonomy and Performance* (dependence/incompetence, failure to achieve, vulnerability to harm, enmeshment), *Other-Directedness* (subjugation of needs, self-sacrifice), *Over vigilance and Inhibition* (emotional inhibition, unrelenting standards), and *Impaired Limits* (entitlement, and insufficient self-control).

All patients were under standard asthma treatment , and they were assured that their participation in the study is completely voluntary and confidential, and they could leave the study whenever they wanted.

The approval code of study in tuberculosis and pulmonary diseases research center of Tabriz University of Medical Sciences is 1392.20.

We used descriptive statistics (frequency, percentage, Mean ± SD), in addition to the Chi-square test for qualitative data analysis. Whereas, independent samples T test was used for comparing the mean difference between two groups.

Results

A total of 50 asthmatic patients were enrolled to the study. The mean age was 30.6 years, and 52% of participants were male patients. No significant difference was found in sex, age (42 ± 8), or BMI (27 ± 15) between the clinical and objective measurements of asthma (such as FEV_1 and FEV_1/FVC). According to the ACT scores, 75% (n = 35) of patients were in the controlled group and 25% (n = 15) were in the uncontrolled group.

Over vigilance domain ($r = -0.41$, $p = 0.003$), and *emotional inhibition* ($r = -0.43$, $p =$

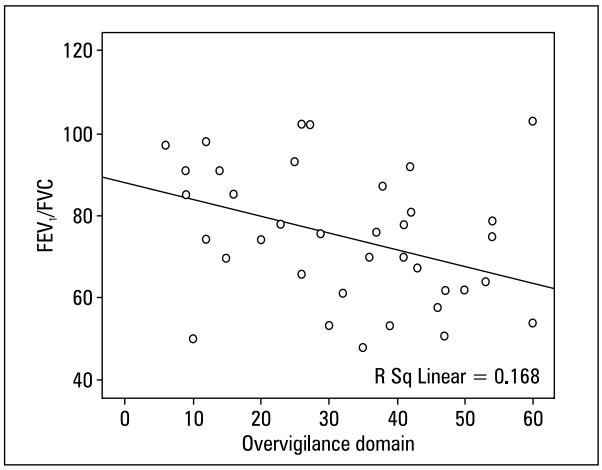

Figure 1. Relationship between FEV_1/FVC and the score of over vigilance domain

0.001) schema areas. Also, another main finding was a reverse linear correlation between FEV_1 and the score in *Disconnection* domain ($r = -0.29$, $p = 0.03$) and *social isolation* area ($r = -0.36$, $p = 0.01$). Similarly, a significant reverse linear relationship was found between FEV_1/FVC and the score of patients in the *Over vigilance* domain ($r = -0.41$, $p = 0.003$), emotional inhibition ($r = -0.37$, $p = 0.007$) and unrelenting standards ($r = -0.31$, $p = 0.02$) schema areas, as illustrated in Figure 1.

There was no significant relation between FEV_1, FEV_1/FVC and other domains and areas.

The mean scores of patients in the domains of personality schema were as follows: *Disconnection and Rejection* (52.12 ± 5.13) (emotional deprivation, 11.8 ± 1.49; abandonment, 12.60 ± 1.46; mistrust-abuse 10.50 ± 0.78; social isolation, 10.80 ± 1.45; and defectiveness/shame, 6.42 ± 1.22).

The mean score of patients in *Impaired atonally and Performance* domain was 35.02 ± 3.8 and in *Failure*, in *Dependence-Incompetence*, in *Vulnerability to harm and illness*, and in *Enmeshment* schema areas were 7.92 ± 1.32, 9.04 ± 1.24, 7.76 ± 1.32, 10.30 ± 1.32, respectively.

The mean score of patients in *Other Directness* domain was 26.84 ± 1.95 and in *Subjugation, Self-Sacrifice* areas were 9.48 ± 1.21, 17.36 ± 1.3, respectively.

The mean scores of the parameters of YSQ -SF schema areas and the clinical asthma severity according to the ACT scores are compared in Table 1. Comparison of the domains of Disconnection domain and Impaired limits domain with clinical asthma severity score are depicted in Figures 2 and 3.

Discussion

The results of the study indicate that clinical asthma severity was significantly higher in patients with abnormalities in *Disconnection* domain (abandonment and defectiveness areas) and *Impaired autonomy and Performance* schema domains (particularly in dependence area). These findings are compatible with those of Yilmaz's study which was conducted on patients with asthma and personality disorders. The authors noted that the obsessive-compulsive disorders were significantly higher in asthma patients than normal individuals, and the quality of life in people with asthma was significantly reduced in comparison to healthy subjects [10].

The present findings are consistent with the study of Leander *et al.* [11], who showed a strong association between respiratory symptoms and psychological status, in a way that wheezing and breathlessness were reported mostly in patients with depression and anxiety [11].

Also, in a study by Ciprandi *et al.* [12], in uncontrolled asthmatic patients with anxiety, it was reported that the lower the ACT scores (assessed by ACT), the worse asthma control. Confirming the findings of Leander's study [11], Ciprandi [12] concluded that anxiety and depression are common comorbidities in asthmatic patients. Thusly, these findings might give a hint that also the assessment of other personality schemas in these patients might be of value.

In the present study, a significant inverse relationship between the severity of asthma (indicated by FEV_1) and *Disconnection* domain was observed. In addition, *Over vigilance and Inhibition* domains of the personality schemas were also found to have a significant inverse relationship with FEV_1/FVC. This supports the findings of the previous research, showing that acute and chronic family stress levels in asthmatic children are associated with increased asthma symptoms. Furthermore, hospital stays caused anxiety and depression, which was correlated with the severity of symptoms and spirometry findings in these patients [5, 7, 8, 13]. In a study by Krommydas and colleagues [14], 65.8% of patients with asthma had symptoms of anxiety and 62.5% had manifestations of depression, and the mean FEV_1/FVC was higher in patients without stress symptoms. But, to our knowledge, there is lack of evidence concerning the association of asthma severity and personality disorders.

Boudreau *et al.* [15] compared the physiological and psychological responses to methacholine

Table 1. Evaluation of parameter of YSQ-SF five schema domains and areas based on clinical control of asthma

	Asthma clinical status		p-value
	Controlled asthma patients (n = 35)	Uncontrolled asthma patients (n = 15)	
Disconnection domain	39.03 ± 3.87	73.47 ± 5.45	0.001 *
Emotional deprivation	10.23 ± 1.43	14.37 ± 1.52	NS
Abandonment	9.00 ± 1.29	18.47 ± 1.30	0.001 *
Mistrust/abuse	8.19 ± 1.35	14.26 ± 1.28	0.032 *
Social isolation	8.94 ± 1.30	13.84 ± 1.56	NS
Defectiveness/shame	2.68 ± 0.45	12.53 ± 1.55	<0.001 *
Impaired atonally & performance domain	23.74 ± 2.60	53.42 ± 3.98	< 0.001 *
Failure	4.81 ± 0.88	13.00 ± 1.57	0.007 *
Dependence/incompetence	5.26 ± 0.96	15.21 ± 1.13	< 0.001*
Vulnerability to harm & illness	8.48 ± 1.12	13.26 ± 1.50	NS
Enmeshment	5.19 ± 1.04	11.95 ± 1.50	0.022 *
Other directness domain	23.74 ± 1.65	31.89 ± 2.18	0.040*
Subjugation	8.23 ± 1.07	11.53 ± 1.34	NS
Self-sacrifice	15.52 ± 1.24	20.37 ± 1.28	NS
Over vigilance domain	32.42 ± 2.12	36.32 ± 2.36	NS
Emotional inhibition	13.19 ± 1.34	14.74 ± 1.77	NS
Unrelenting standards	19.23 ± 1.10	21.58 ± 1.02	NS
Impaired limits domain	18.90 ± 1.92	29.21 ± 2.11	0.016 *
Entitlement	10.06 ± 1.12	13.63 ± 1.04	NS
Insufficient self-control/self-discipline	8.84 ± 1.09	15.58 ± 1.16	0.005 *

Controlled (ACT score ≥ 20), Uncontrolled (ACT score < 20), p > 0.05 = non-significant (NS),
*p < 0.05 = significant
Values are M (mean) ± standard deviation (SD)

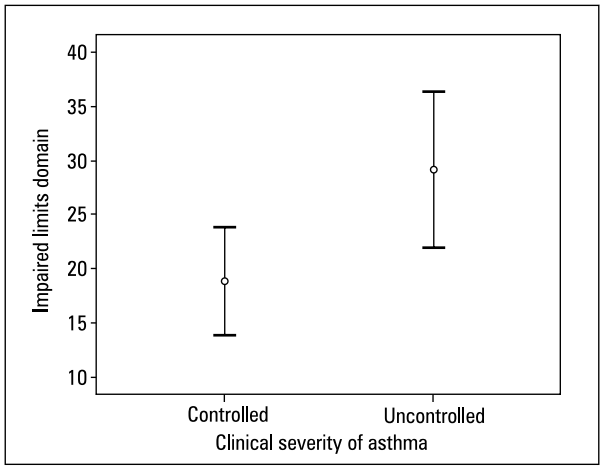

Figure 2. Comparison of the impaired limits domain of personality schemas and clinical asthma severity

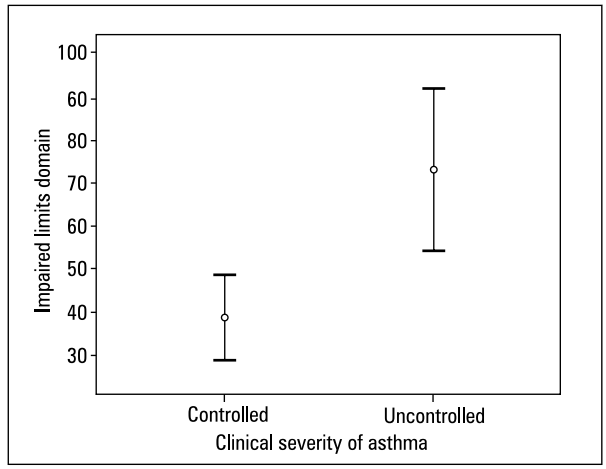

Figure 3. Comparison of the disconnection domain of personality schemas and clinical asthma severity

provocation test in asthmatics with panic disorder, and reported higher levels of subjective distress without evidence of significant airway responsiveness. This suggest that the symptoms aggravation in these patients might be due to subjective symptom perception by the patients rather than the severity of underlying asthma.

The mean scores of patients in *impaired autonomy and performance*, and *disconnection* domains were significantly higher in the uncontrolled group than the controlled group. Mohammadi *et al*. [16] reported similar findings. This study showed that patients with asthma had a relatively high mean cognitive schema score compared to healthy subjects.

Studies on the characteristics of asthmatic patients show that one of the important features of their personality is highly dependent character, where extreme fear, emotional instability, sensitivity to rejection, lack of perseverance, and persistence in difficult conditions are more prominent [8]. However, it is still controversial if the high prevalence of anxiety and depression in patients with asthma come from the complications of the disease itself, as mentioned earlier, or the possibility of a genetic association between psychologic disorders and asthma [13].

Loerbroks *et al*. [17] found that among middle-aged adults, neuroticism was positively associated with an increased risk for asthma, and stressful life events such as divorce could trigger an asthma attack.

Lyketsos *et al*. [18], also, indicated a high correlation of anxiety and depression in patients with asthma when compared to other diseases.

In another study, 40 patients with mild asthma and 25 patients with severe asthma showed a high rate of anxiety disorder, but there was no association between asthma severity and anxiety [19].

Bussing *et al*. [20] observed that the prevalence of anxiety disorders was two times higher in patients with asthma than subjects without asthma. The most reported anxiety disorder was related to separation disorders, but there was no association between the severity of asthma and the anxiety disorder.

In our study, there was a strong association between some EMSs and asthma severity, particularly if asthma was uncontrolled. Thusly, aside from appropriate medical therapy of the condition, identifying and managing the underlying personality disorders might have advantages in asthma control.

There were some limitations to the study. We did not take socio-economic situation and education of the patients into account. On the other hand, the participants in the study were only the cases of stable asthma, and subjects with unstable asthma or history of recent asthma attacks were excluded.

Conclusion

Findings of the study depict that some EMSs are related to clinical and objective evidence of asthma severity. These observations highlight the necessity of psychiatric diagnostic interview in asthmatic patients in search for possible EMSs, whereas this evaluation might be important for the management of asthmatic patients.

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Conflict of interest

There is no conflict of interest in this study. This study complies with ethical considerations and all the procedures were in accordance with Helsinki declaration.

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